STRATEGY RESEARCH PROJECT

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THE EVOLUTION OF ADVANCED INDIVIDUAL TRAINING IN THE U.S. ARMY SIGNAL CORPS

BY

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The Evolution of Advanced Individual Training in the U.S. Army Signal Corps

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ABSTRACT

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The purpose of this paper is to take a historical look at the challenges that have faced the Signal Corps in the initial training of its soldiers and to glean some lessons learned that could be used to improve current or future methods. What to train and how to train signal soldiers have always been impacted by three factors; time available, new equipment entering the Army inventory and the educational aptitude of the new soldier. History provides excellent examples of how the Signal Schools adapted their training curriculum when one or more of these factors changed. From that perspective, the future will be no different. With the speed at which our technology is changing and a defense budget that shows no appreciable future growth, those same three factors, time, new equipment and quality soldiers will continue to challenge the Signal Corps as it trains the signaleers for the 21st Century. There are lessons learned that should not be forgotten as we begin the digitization process of Force XXI. The challenge to remain ready to fight our Nation's wars today, yet be prepared to fight the wars of the

future requires carefully planning. The Signal Corps can meet the challenge by carefully managing the way they train their soldiers.

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PREFACE

I would like to take this opportunity to thank all of the people who have helped me to complete this research project. My primary thanks goes to COL Ralph Ghent, who as my Project Advisor, kept my nose to the grindstone, and provided me with a lot of editorial guidance. His recommendations have vastly improved my project and I am indebted to him for his critique and the time he gave me. I also need to thank the staff of the Carlisle Barracks' Military History Institute, both in the library and the archive sections. Their willingness to find the appropriate resources and point me to them made my research a lot easier. It was a joy to work with those dedicated professionals. Last, but not least, I need to thank three other Signal Corps Officers, who have been part of this project. Colonels Pete Dausen and Tom Noreen and Lieutenant Colonel Keith Snook, shared with me the efforts of their research and provided me numerous resources that helped me to finish this paper. They also provided a lot of moral support that got me through this project. They are great Signal Officers and it has been a pleasure to work with them.

Soldiers can only be ready when they are trained for the job that they are doing and doing the job they are trained for. To insure that our Army can perform as the nation deserves and expects, we must continually insure that they are assigned where their training, knowledge, and experience contribute to the Army's readiness.

—General Creighton W. Abrams

The Army's fundamental purpose of fighting and winning the Nation's wars has always required trained and ready soldiers. Training has always been an underpinning of readiness. Indeed, it is one of the Army's imperatives along with quality people, doctrine, leadership, modernization, and force mix. So critical is this mission of training that extraordinary resources, in time, money, and personnel are allocated to insure the job is done right. Former Chief of Staff of the Army, General Carl E. Vuono, left no doubt of its importance. "Training will remain the Army's top priority because it is the cornerstone of combat readiness."[1]

The mandate for quality and relevant training requires leaders at all levels to evaluate just how effective their programs are. This is just as true in the training base, where young men and women experience their first taste of Army life and undergo their initial Army training. At installations across America, these new soldiers undergo their basic and advanced individual training in preparation for their first assignment. The intent of this paper is to

look at the training given to the soldiers assigned to the Signal Corps and evaluate its success over the course of time from World War II until the present. Analysis will focus on how well the Signal Corps adapted its advanced individual training (AIT) to new equipment and changes to doctrine and organizations. Finally, an assessment will be made of the Corps' preparedness to train the soldier of tomorrow for the next battle.

ADVANCED INDIVIDUAL TRAINING

The goal of initial entry training (IET) has remained relatively unchanged over the course of the past fifty years. The terminology has changed, but the intent, "to produce motivated, disciplined, and physically fit soldiers who are trained in both basic and military occupational specialty (MOS)-related skills, and who are capable of taking their place in the ranks of the Army in the field,"[2] has not. Advanced individual training is the subset of IET that qualifies enlisted soldiers for the award of a MOS. Since the onset of World War II, the Signal Corps has trained hundreds of thousands of soldiers to become army communicators. Not surprisingly, the subjects have changed over the course of time as new equipment and technologies have been introduced to the field, as new fighting doctrine was developed and as lessons learned filtered back to the Signal School. But there are constants present in 1940 that remain today. Challenges such as, how much time should be devoted to

what subjects; the quality of the enlistee; and how to incorporate new equipment training still challenge leaders at today's training bases. To get a better understanding of how the Signal Corps' training has evolved, let's begin with the largest American military build-up, World War II.

WORLD WAR II

Prior to President Roosevelt's proclamation of a state of "limited emergency" in September 1939, the Signal Corps was training only certain specialties at the Army's Signal School, located on Fort Monmouth, New Jersey. The School had just instituted a new method of training called the "step-by-step" method. This new method of training assigned students for ten months to the Wire and Radio Divisions of the Signal School's Enlisted Men's Department. Ten new students were assigned each month. The training was self-paced, included self-administered quizzes at the end of each lesson, progress tests at the end of about eight lessons, and a proficiency test at the end of each subject. Upon successful completion of all subjects in a subcourse, the soldier would move on to the next subcourse in that particular course of instruction. Diplomas were awarded to students who completed three or more subcourses in the wire course and two or more in the radio course. If any student completed all of the subcourses in less than ten months, he graduated early and was sent back to his unit. The soldiers who attended these specialist courses were competitively selected by

their units and sent to the Signal School for this intensive training. New soldiers who scored high on screening tests at the reception centers were also sent directly to Fort Monmouth. Training for all other new soldiers in installing and operating field signal systems was normally conducted at their first unit of assignment.[3] The start of World War II changed all that. The War Department directed that the ten month courses be eliminated, except for radio and telephone electricians and teletype repairmen. The rest of the signal courses were redesigned to last four months, only to be reduced again by the Army's direction to three months, a mere six months later. These "ninety-day wonders", although laughed at by many, became the new breed of signaleers.[4] Pressed for time, these soldiers would become specialized in either field or fixed station radios and wiremen would be cable splicers, frame men or inside men, instead of well rounded soldiers capable of operating and maintaining all types of radios or installing and maintaining all types of wire and cable.[5] But these specialists were a small percentage of the total signal force as eighty percent were "non-specialists". These soldiers received training at their first units or at the Replacement Training Centers (RTC) and became linemen, pigeoneers, switchboard operators, and field radio operators, for example. The signal training at the RTC was only four to eight weeks in length.[6]

As the demands for signal soldiers continued to grow, the Signal Corps was forced to open new training centers all over the country. The two largest centers were Camp Edison, New Jersey (near Fort Monmouth) and Camp Crowder, Missouri. Camp Crowder, activated in December 1941, quickly became the largest. Advance training continued to change and the number of different courses grew. At Camp Crowder, the school's three-month courses were for Cable Splicers, Framemen, Insidemen, Common and Local Battery Installer-Repairmen, Powermen and High Speed Radio Operators. Four-month courses were given for Radio Electricians, Fixed Station Radio Operators, Repeatermen, Switchboard Installers, Telegraph Printer Maintainers and Wire Chiefs. Unlike Fort Monmouth, the School at Camp Crowder had a third division in its Enlisted Men's School called Common Subjects along with the traditional Wire and Radio Divisions, where all students except radio operators went for instruction in Principles of Electricity and Basic Shopwork. In 1943, Camp Crowder initiated weekend field exercises, which eventually expanded into a three-week period of "on-the-job" training where soldiers installed full-scale communication networks and repair personnel operated a model radio repair depot.[7] These changes to the curriculum, at all of the training centers, resulted from visits to the operational theaters and from new staff members who returned from overseas duty.[8]

The method of instruction that was developed in the late 1930s was still being used with some alterations at the Signal Schools in the 1940's. Courses were still self-paced, with students taking self-administered tests and an instructor periodically testing students to ensure no one was falling too far behind. Training films became common place and training aids either to scale, miniaturized or exploded assisted the students in their operational proficiency or troubleshooting techniques.[9]

Another aspect that affected training was the education and aptitude that recruits possessed. In the early stages of the build-up, the Signal Corps found itself fighting with the other technical branches and the other services for new service members. The RTC, which provided the schools the preponderance of its students, received insufficient numbers of men qualified for signal training. The Commanding General, Services and Supply, was unsympathetic and referred to figures that showed the Signal RTCs were already receiving more recruits who were categorized as Grades I, II and III based on their scores on the Army General Classification Test (AGCT) compared to the other branches. The G-1 of the General Staff tried to help the Signal Corps acquire additional higher aptitude soldiers, but was not very successful. In a two-day period during the summer of 1942, Camp Crowder received 338 recruits, of whom 45 percent had "some schooling" and 36 percent were illiterate.[10] This exacerbated an already critical shortage of approximately 4,200 trained signal

specialists, as many of the recruits in the lower mental categories were either transferred to units as basics or trained as linemen or chauffeurs because they couldn't absorb the highly technical training.[11] The Chief Signal Officer, faced with shortages in very technical specialties, ordered the school seats filled. Recruits who showed "promise of making acceptable students would be enrolled".[12] The method of teaching changed to include more lectures because of the "progressively declining academic capabilities of the student."[13]

Eventually, others came around to understanding the need for high quality soldiers in the Signal Corps. By war's end, a high percentage of AGCT Class I and II recruits were entering signal training, predicated on the tremendous growth and complexity of electronics on the battlefield.[14]

It was very difficult, if not impossible, to predict personnel requirements because of the numbers of new organizations that were created and a lack of updated Tables of Organizations for others. So shortages continued to remain no matter how many students graduated from the Centers and the Schools. One solution to get soldiers to the field faster called for pulling them out of schools two weeks before graduation. The Army believed that a partially trained man was better than one with no training. But the courses had already been shortened to the bare necessities; the two-week curtailments sent men into action without some essential training.[15]

A solution used overseas to assuage this dilemma was the development of signal schools. Eventually both overseas theaters were operating schools. The Signal Corps Training School in the Southwest Pacific Area conducted eighteen mini MOS courses for their new replacements.[16] The European Theater also had the same problem and the same solution.

> "One of the more notable programs initiated by signal planners at Allied Force Headquarters (AFHQ) was their training program. The need for a continuous signal training program became evident very early. Men were arriving from the United States without adequate training, too often taken from schools and training centers before they had finished their courses in order to fill urgent overseas requisitions. At the same time, as field commanders became increasingly conscious of the importance of signal communications and more aware of what good communications could do for them, the standards of proficiency they demanded of their signal troops rose proportionately. From these beginnings evolved the extensive theater signal training program that, in one guise or another, continued until the end of the war."[17]

Another interesting training development that arose during World War II was the Unit Training Center (UTC) which was peculiar to signal training centers. The assessment from the field and the Signal Corps, by mid-1943 was that, "the greatest need was for more closely-knit troop units, men drawn together in small groups and thoroughly instructed in teamwork.[18] The first UTC began operation in July 1942, with the mission of directing, supervising, and inspecting team and unit training. The goal was to develop well-trained teams and units for service overseas.[19]

The difference between the RTC and UTC was that soldiers, after completing six weeks of basic military training in the UTC,

would undergo eight weeks of specialist training and then begin three weeks of team training. After becoming part of a team and/or a unit, the soldier received six more weeks of training. If time allowed, there was more advanced team training or individual signal training until the team or unit shipped out.[20]

The introduction of new equipment provided another challenge for the Signal Corps. Initially, new types of communications equipment were always sent to the deployed forces and then eventually some limited quantities would find their way to the training base. Because the new equipment arrived last at the Schools, soldiers trained on the older assemblages. To compensate, the Schools' staffs often created elaborate training aids as substitutes.[21]

The inability to train new soldiers in the School on the newest equipment created significant problems in the field. The introduction of spiral-four cable to the field provides a clear example of the dilemma. Spiral-four field cable, which could replace four individual wire lines, had been tested and was ready for fielding. The AFHQ had ordered the cable in quantities, but no one there understood its use. When the first shipment arrived, early in 1943, it came without instructions or manuals so it was issued as long-range field wire. And as field wire, it was mishandled and installed so poorly that many officers were convinced that this new "wire" was useless. Consequently, a team from Fort Monmouth had to be dispatched to North Africa to

provide the necessary instruction in the installation and operation of the cable and other new pieces of equipment used with it.[22]

As World War II drew to a close, all signal training was consolidated back at Fort Monmouth. But it was not long until the conditions there became overcrowded, so a new Signal Corps Training Center was opened at Camp Gordon, Georgia in October 1948. It consisted of The Southeastern Signal School (TSESS) and the Unit Training Group. TSESS provided training in communications operations and shorter electronic maintenance courses, while the school at Fort Monmouth taught the longer maintenance courses.[23]

KOREA

When the war in Korea erupted, a couple years later, the Army's training bases began to gear up for the influx of new inductees. The Signal Corps was still conducting training using the same model developed during World War II. The Corps began operating a Replacement Training Center (RTC) at Fort Gordon. Like its predecessors, it provided basic training and offered courses in pole line construction, message center and teletypewriter operations. Basic training was eight weeks in length and the basic communications training lasted eight weeks for the less technical MOSs. The Signal Schools still provided the training for the more highly specialized MOSs. Those courses ran from ten to twenty-five weeks in length. Practical

application and individual training provided the bulk of the class time. In one subcourse, of the sixty-eight hours of class time, only eleven hours were by lecture. After their classroom study, they moved into the field where they were given first-hand experience in inter-echelon communications.[24]

The Unit Training Group (UTG) swelled in size. Much like the Unit Training Centers of the last war, the UTG trained teams and units, which included National Guard and Reserve units that were activated.[25]

Although the training structures made the beginning of the Korean War look a lot like World War II again, it clearly was not. Korea had been declared a limited war and the President decreed only a partial mobilization. Draftees, who were required to serve for only seventeen months, presented another training challenge. Lieutenant Colonel A. E. Holland, G-3, Signal Corps Center and Fort Monmouth lamented,

> "Under the existing regulations, men are drafted for a period of 17 months. In the highly specialized Army of today, that is barely enough time to produce a "basic", let alone the highly-skilled specialists and technicians needed by the Signal Corps. By the time a young man has completed his basic training and is ready for special training, there is little time left to prepare him for his tasks."[26]

In 1949, the Enlisted Department had already changed their philosophy from teaching theory, to providing practical knowledge. Gone were the self-paced individual programs. They were replaced by group instruction. Still, the soldiers normally did not acquire the skills to maintain or repair equipment until

they got to their units. So as Korea heated up, the Schools began experimenting with another way of providing instruction. The lecture followed by laboratory exercises gave way to a performance-type-training program. Now soldiers spent most of their training time "doing" and spent little time "listening". Traditional subjects such as basic electricity and repair shop operations were incorporated as supplementary information into each MOS course, instead of being taught as separate subjects.[27]

The abilities of students to comprehend instruction still varied widely with the mix of draftees and those who enlisted. Instructors at Camp Gordon found the wide range of educational experience in their students a challenge, as they tried to stimulate the college educated, while not confusing those with less education.[28]

The Signal Corps did find a partial solution to the problem of incorporating new equipment training into the course curriculum. A program called Training with Industry allowed both officers and enlisted men an opportunity to work with the civilian communications industry, which brought them in contact with the new signal equipment that the Army was procuring. These soldiers were then brought back to the schoolhouse and utilized as instructors. This gave the Schools the opportunity to incorporate the new equipment into the curriculum very quickly. Units with new equipment started to receive qualified soldiers must faster than in the past.[29]

POST KOREA - PRE VIETNAM

The intervening years between Korea and Vietnam provided the Signal Corps an opportunity to continue refining their instruction methods. In some cases, the changes appeared to be budget driven. The use of educational television is a case in point. Studies showed great merit in the use of television in recognition training, rote learning and training soldiers with low aptitudes. Used throughout the schools, it required fewer instructors and training devices and proved to be a useful way to orient students on new equipment. This was very practical when the equipment was not available to train on or too few in numbers.[30] Television was also used to save the instructors and students' time by bringing some training that would normally be conducted outdoors into the classroom.[31]

An issue that continued to persist was the qualifications of the students. Regulations in 1955 prohibited a two-year draftee from undergoing any training that exceeded sixteen weeks. Since many of the Signal Corps' very technical specialties were twenty or more weeks in length, the students for those courses had to be soldiers who enlisted for three or more years. According to Fort Monmouth's records, these soldiers' educational backgrounds were often not as strong as that of the draftee. The schools earlier change to a more hands-on, practical method of instruction lessened the impact of that personnel policy.[32]

During Fiscal Year 1958, in an effort to provide new soldiers a better understanding of their part in the larger communications network, Fort Gordon began operation of a Signal Integrated Training Facility (SITFAC). The SITFAC, "equipped with the latest communications equipment and systems normally employed in a theater of operations, provided a means for training individuals, teams and units in an integrated communications network."[33] This facility was similar in principle to the network developed in the rather vast training areas of Camp Crowder in World War II.

VIETNAM

The United States' escalated participation in Vietnam seemed inevitable and the Signal Corps, like the rest of the Army was working contingency plans. But when President Johnson announced a 235,000 personnel increase for the Army, he surprised everyone by not calling up the reserves. The Signal Corps had been planning to use reserve units, not draftees. The Signal Schools again had to mobilize for another onslaught of new soldiers to train to meet the demands.[34]

Like Korea, Vietnam presented the Schools with a new set of difficulties. First was the rotation period, which was set at one year. This constant turnover required a steady flow of replacements. Compounding that was the need for those soldiers to have specialized training in the new troposcatter systems that contractors had installed over there in 1962. In a situation

reminiscent of World War II, the initial sets of radios and associated equipment were sent to Southeast Asia and not to the Schools. So for nearly two years, replacement soldiers arrived in Vietnam needing on-the-job training. The first operator's course for the troposcatter radio was finally started in 1964, but it could not keep up with the requirements for troposcatter operators.[35]

An Army-wide change that affected the length of signal training was the transfer of training responsibility from the Chief of Signal to the Continental Army Command (CONARC) in 1962. CONARC continually pressed the Signal Corps to reduce the time it took to train a signal soldier when compared to that of an infantry soldier. Ultimately the advanced individual training (AIT) for those MOSs that only required basic communications skills (wiremen, single channel radio operators and repairmen) became eight weeks in length at the training centers.[36]

Unable to keep up with the demand for soldiers from both Southeast Asia and the rest of the Army, Fort Gordon resorted to conducting twenty-four hour operations to maximize facility usage. Unfortunately, even with those Herculean efforts, some signal units in 1965 ended up conducting AIT for their new soldiers.[37]

With courses cut to the bone, soldiers now were receiving less instruction and spending only a couple of days of training in the field. This had a major impact, as soldiers arriving in

units lacked experience in antenna installation, grounding, generators, and more importantly, troubleshooting. Without troubleshooting skills, when confronted with a problem in an operational system, soldiers would just exchange out major components until the system was working again. This inability to isolate problems caused insufferably long outages and hindered all outside efforts to troubleshoot.[38]

Major General Thomas M. Rienzi, Commanding General, 1st Signal Brigade and concurrently, Assistant Chief of Staff, Communications-Electronics, Headquarters, United States Army Vietnam had some concerns with the training of signal soldiers during the Vietnam War. One was the perceived lack of fundamental communications knowledge among soldiers in several of the MOSs. These soldiers were trained only to an apprentice level and could not troubleshoot or restore circuits. Another concern was the lack of sufficient aptitude in logic and electronics for repairmen to fix the components of the automated message centers. Lastly, he found that enlisted men were lacking in basic military subjects, like site defense, weapons and map reading. He recommended that they also receive training in supply procedures and vehicle maintenance.[39]

The Signal Schools did not take those concerns lightly. Throughout the course of the war, they sent observers to South Vietnam to get as first-hand information by talking to the commanders about training problems. Returning veterans were

assigned as instructors to take advantage of their experience. Although there were some improvements, some things were never resolved to some signal officers' liking.[40]

Changes were made to some courses at Fort Gordon where most of the tactical signal training was now being given. A signal company was assigned there, whose expressed mission was to provide students some hands-on operational experience and troubleshooting techniques using the company's equipment and under their supervision.[41]

Other changes included a return to some self-paced, programmed instruction to teach students basic electronics and mathematics. Fort Monmouth developed a new high-tech method in 1968, with the first computer-assisted instruction. Used initially to teach an eleven-hour block of instruction in electronics, the computer allowed the soldiers to progress at their own rate. The computer would test the student on each block of material presented and if required would repeat the instruction until the student could pass the test. An instructor was available to assist those who still needed additional help.[42]

The rapidity with which new equipment flooded the field continued to keep the signal schools behind the power curve. Again, at the heart of the issue was the cost of these new technologies and their unavailability at the Schools. When equipment did arrive, there were too few to train all of the students. The Schools solution was a training method called

piggybacking. It required four to five students to work together on one piece of equipment, making it difficult for the instructors to know if every student could perform all the tasks.[43]

The problem wasn't just one of equipment on-hand. It often took the schools too long to implement new courses. Besides the troposcatter radio already mentioned, the AN/VRC-12 series, frequency-modulated radio fared no better. After fielding, it took the schools three years to conduct a one-week repair course and four years to start the operators training.[44]

MG Rienzi commented:

> "In the matter of the Army's training centers in the United States, I believe these training centers must receive new equipment that is to be introduced into the combat theater at about the same time as the Army's new equipment introductory teams receive it. For one reason or another this did not take place in the instance of Vietnam. This mistake should not be repeated. . . . Military instructors should be with the manufacturers when their plans and equipment and equipment are being developed. If this procedure is not followed, major problems will arise. Repeatedly during the Vietnam War, new equipment was introduced into the war zone and we had to train ourselves to operate and maintain it. . . . Our solution, of course, was to establish a signal school . . ."[45]

POST VIETNAM

Vietnam did not slow down the speed at which new technologies developed with in the Army. The Signal Corps found itself becoming extremely specialized as a result of automation and the development of highly sophisticated electronics, to include satellites. For example, a message center originally functioned

with only a message clerk, teletypist and a cryptographer. The Automatic Digital Network (Autodin), the replacement messaging system, required twelve different MOSs to make that computerized system work.[46]

By 1970, the Army's Signal Schools were teaching ninety courses compared to the twenty-six courses at the end of the Korean War. The training periods also had become longer as more and more new equipment was added to established MOSs. The course lengths had grown to an average of twenty-four weeks with forty-one weeks then being the longest. In the early 1950s, the average course length was only around seventeen weeks and the longest was thirty-three weeks. To keep courses from becoming too lengthy, the Signal Corps began to split some MOSs into two new ones, each covering different major end items or assemblages.[47] This required the Corps to re-look their manning documents often to ensure that old MOSs were replaced with the proper new ones.

Another system developed to keep the courses as short as possible was the Additional Skill Identifiers (ASI). Under this system, students would learn the basics of a certain MOS and then attend an additional course(s) to specialize on certain pieces of equipment. Early computers provided a good example.

> "The Signal School designed a computer technology course with six follow-on or functional courses, each separately identifiable. When a student finishes the technology course of 19 weeks, he is basic MOS (34D) qualified, but must attend any one of the several follow-on courses to become an equipment specialist.

> Thus, if he is channeled into the National Cash Register-500 repair course, he works only with that equipment. After 18 weeks, he graduates and is awarded the MOS and ASI signifying proficiency on the NCR system. His 37 weeks of training enable him to maintain the NCR-500 computer/inventory control device, but he cannot work on the UNIVAC 1005/1004-DLT-6. Another man with a different ASI is trained to do this."[48]

Those changes made to the training of signal soldiers made personnel assignments much more difficult. Personnel managers had to know both the MOS and ASI requirement of a position before assigning a soldier. This daunting challenge was never satisfactorily overcome. The assignment of soldiers based on an ASI is something that still troubles the personnel assignment process today.

THE EIGHTIES AND NINETIES

The proliferation of new and more sophisticated equipment and systems continued and kept the Signal School at Fort Gordon busy trying to design courses and MOSs to keep up with the changes. In the 1980s the number of MOSs had dropped to thirty-one, but the ASIs had grown to twenty-seven. Before the decade was out, the number of MOSs remained at 31, but ASIs had jumped to 44 as a result of the growth of computers and automation in the Army.[49]

The all-volunteer Army truly fixed the past problems of soldiers without sufficient educational aptitude from joining the Signal Corps. Ninety-six percent of the new recruits in 1987, were high school graduates and eighteen percent had from one to six years of college.[50]

Late in 1988, the Signal Corps underwent a major doctrine, organizational and equipment revolution with the acquisition of Mobile Subscriber Equipment. It brought some significant changes to the Signal School, too. For the first time, a contractor was responsible for the resident training at the schoolhouse. Although generally judged to be a success, a major problem with the course of instruction was insufficient hands-on training for the large extension node operators. The contract was amended and a new course of instruction was added to remedy that situation.[51]

Although history had taught the Signal School the utility of conducting a Field Training Exercise (FTX) where students could participate in the installation of a complete communications network prior to graduation, it was often cut completely from the schedule or severely altered. This had occurred in the years preceding the fielding of MSE. Soldiers were graduating, well schooled in their MOS, but with little or no knowledge of how a network worked. This caused some difficulties when participating in their first field exercise at their new units, especially when trying to install circuits and troubleshooting problems.

The Signal School corrected this deficiency by creating a Systems Training Exercise where students participated in the installation of a network and became familiar with the other pieces of equipment involved. With the advent of MSE, the School addressed this training requirement and created an in-house MSE company, whose mission was to put students through a realistic

training exercise before graduation. For the first time since entering their AIT, transmission systems operators and switching systems operators worked together installing a complete network and performing other critical tasks to include troubleshooting.[52]

The training programs used for MSE training continued to be group-paced and performance oriented. The main methods of instruction were group instruction, demonstration, and practical exercises. The Network Switching Systems Operator-Maintainer (MOS 31F) course ran eleven weeks. The follow-on course for that MOS, Node Center Switch/Large Extension Switch (ASI V4) course was an additional four weeks. The Transmission Systems Operator (MOS 31D) course was nine weeks.[53]

Compared to past methods of bringing new equipment training to the Signal School, the MSE fielding had the fewest problems. But there was a small hiccup. MSE was fielded to the 1st Cavalry Division in February 1988; the Signal School opened their contractor-ran resident school over a year later in May 1989[54]. The delay was necessary to allow the school to train all the other MOSs that still populated the tactical units awaiting their new equipment training. But the delay hampered the schoolhouse from answering MSE questions from the field, as the school staff did not have adequate expertise for more than a year.[55]

TODAY

The Signal School is now conducting courses for 18 MOSs and 12 ASIs.[56] The reduction in the number of courses can be contributed in part to the merging of MOSs into one broader MOS and a reduction in the numbers of different communications systems employed throughout the Army. For example MOS 31U, Signal Support System Specialist, subsumed three older MOSs. The length of the courses range from seven weeks for a cable system installer-maintainer to 34 weeks for a satellite communications systems operator-maintainer.[57]

Today the classes are still task oriented, using the group-paced training method. Many of the hours of instruction involve hands-on training utilizing practical exercises. The 31F/31R STX, at the end of the course, is a week in length. Student comments indicate that this was most beneficial and would have liked a longer STX. The 31Us rotate through five simulated TOCs (Tactical Operations Centers) representing the battlefield functional areas. This exercise runs for two weeks and is the highlight of the course, according to student critiques.[58]

The Signal Corps continues to get some of the brightest recruits across all MOSs. For example, the 31U course has added COT (Commercial off the Shelf) computer lessons to its curriculum to meet the automation needs down to the battalion and company level. The aptitude requirement for this MOS is the second lowest of all signal MOSs, but the soldiers have had no problems

assimilating these new technical skills. The 31U course has very low attrition rates, which are mostly administrative in nature, not academic.[59]

Incorporating new equipment into the courses still provides some challenges. Fielding plans still allots the School only incremental fills of certain new equipment. This requires students to share equipment until the fielding is complete and the School receives its complete allocation.[60]

COMPARE AND CONTRAST

Mobilizing for World War II had a tremendous impact on signal training that still lingers even today. Long gone are courses ten-months in length, where soldiers learned everything there was to know about radios or wire. What evolved was the signal specialist, a new signal soldier trained only in a particular type of radio or aspect of wiring. A side effect, was a proliferation of MOSs. Courses were shortened out of the necessity to produce thousands of soldiers in a very short period of time. At the end of the war, it was impossible for the Signal School to go back to the more exhaustive training it had perfected in the 1930s. Budgetary constraints and a proliferation of new equipment made it impossible. Before the war there were only two kinds of signal specialists. During the war those two specialties spawned twenty specialties as the courses were shortened and limited in focus. During the Korean War the MOS producing courses had grown to twenty-six. After

Vietnam the number of courses had mushroomed to ninety. This reflected the amount of new signal equipment that flooded the Army. Today, the number of courses stands at thirty, including the ASIs. To get there, the Signal School has combined a number of MOSs into one MOS to reduce the number of specialties. The current MOS 31P (Microwave Systems Operator-Maintainer) course now covers 28 major pieces of equipment and is twenty-seven weeks in length.

The method of instruction has changed only moderately over the course of time. In earlier times, it was individual self-paced instruction. But the sheer number of soldiers that transited the Schools during World War II required a drastic change. Resources, instructors, and time were at a premium. What eventually evolved that satisfied the demand was group-based instruction. Interestingly, there has been very little change since then, except in the 1950s, when performance oriented training replaced lectures and the teaching of theory. Technology though, has impacted some lessons. Where material was once only provided by an instructor; films, tapes, television and computers have now been added as methods of presentation.

The all-volunteer Army has been a positive factor in selecting recruits for the Signal Corps. History showed that the Selective Service and the draft did not guarantee all soldiers arriving at the school were capable of understanding the difficult technical aspects of signal training. That serious

shortfall had major consequences. Methods of instruction had to be changed and classes in math and science had to be provided to those who lacked the requisite education. Those that still struggled were either relegated to the "easiest" signal MOSs or, as in World War II, became chauffeurs or other non-technical specialists, leaving the Signal Corps woefully short of soldiers to fill very technical positions. Since the institution of voluntary enlistment, high quality recruits have been the norm for over twenty years and academic failures have virtually disappeared at the School.

The introduction of new equipment to the field has always been a difficult challenge to the Signal Corps. When the Army was engaged in earlier wars, new technologies tended to come fast and furious, often without manuals and training. Painful lessons learned did result in some changes. Typically the equipment now arrives in units with some type of new equipment training (NET) package, which includes manuals and instructors. At the Signal School, the ability to generate new courses and graduate soldiers with adequate training has always been directly related to when and how much new equipment was received. At one time, the School was the last organization to receive new equipment that has changed. Fielding schedules now allow them to receive incremental deliveries over a period of time until they reach their authorized fill. The challenge has been to get enough equipment up front so sufficient numbers of soldiers can receive

the appropriate training before arriving at units that already have the equipment. This remains an issue today.

CONCLUSION

The Signal Corps' ability to respond to our Nation's crises and adapt to the furious tempo of technology changes has been absolutely remarkable. The training of America's young men and women to perform as signal soldiers has throughout history been impressive, but not flawless and caution must be exercised as we move into the 21st Century. There are some current practices that need to be scrutinized as the Signal Corps prepares to train future signal soldiers.

The first concerns the issue of consolidating MOSs. During the past five years, the Signal Corps has not only consolidated some MOSs, they have also eliminated some ASIs, by including them as part of another MOS producing course. These actions have been more pronounced within the MSE MOSs. Consolidation has two major impacts. At the training base, it affects the amount of time spent learning any one piece of equipment. Where a soldier once understood how to operate a couple of multichannel radio systems, he or she must now be competent in as many as eight or more different ones. Courses no longer can spend the time teaching students everything there is to know about each assemblage. Now students are expected to gain expertise on many pieces of equipment. Time does not permit making them experts on everything and it is questionable that a soldier could absorb all

of that highly technical information. Consolidation also affects soldiers in the field. Often the additional pieces of equipment added to an MOS are not available in the soldier's current unit, precluding any chance for training or familiarization. If the soldier's next unit has this "new" equipment, he or she is at a major disadvantage. The gaining unit's expectation is that the soldier is already fully trained. Instead, he or she becomes just one more soldier that the unit has to train, which degrades readiness. It is particularly tough on sergeants and senior specialists who are often expected to be the team chief. The effects of consolidation are evidenced in the declining ability of soldiers to trouble shoot their systems. Twenty years ago when units went on a FTX, the only maintenance personnel that came along were those organic to the unit. Today, it is impossible not to find Communications Electronics Command (CECOM) logistics assistance representatives and contractors at every exercise or deployment. In garrison, the CECOM representatives are called upon to help provide additional training to soldiers in the Electronics Maintenance shops. Before one more MOS subsumes another, or one more piece of equipment is added to it, an external evaluation needs to be conducted in the field to ascertain how well trained our new soldiers are. The Signal Corps cannot rely only on input from units; they are too busy to provide a careful evaluation.

Force XXI and the proposed incremental yearly fielding of "digitized" divisions will be another training challenge. If the Schoolhouse does not start training "digitized" soldiers, the units (i.e. the division signal battalions) will have to devote time and resources to pick up the slack. This will have a tremendous impact on unit readiness and their ability to support a Division's training cycle. But the Signal School cannot afford to make major changes to its curriculum because the other divisions and Corps will be using the current, undigitized equipment for some time. A solution, which would require an exception to current personnel policy, would be to move those soldiers only within units that have the enhanced or new equipment. It makes sense and is economically feasible for all but those in the senior ranks.

Another concern is the current policy of graduating soldiers that are not fully trained. The old philosophy that the Signal School could send new soldiers to units needing a minimum of ninety days OJT in their MOS worked in the Cold War era, but not now. Since the fall of the Berlin Wall, the Army has been involved in increasing numbers of deployments and some like Bosnia and Southwest Asia have no end in sight. It is quite disconcerting that soldiers graduating from the Signal School are heading to units that are deployed or preparing for deployment, needing OJT. The training has to occur at the School. Rear Detachments are not resourced to do the job.

With budgets tightening to allow for modernization and deployments being financed out of current budgets, it is easy for the Army to look to the training base for monetary savings. The Signal Corps needs to be very careful and stand their ground. Communications equipment is not becoming any less complex. Technology is driving networks down to company level in the combat arms, where not long ago, they only had a radio. It is imperative that signal soldiers know their stuff to keep these networks operational. Thorough training is the only answer. The Signal Corps must ensure that tomorrow's signaleers are truly "specialists". The Army cannot afford to have "somewhat trained" signal soldiers.

Word Count: 6953

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